Best Management Practices
for Water Quality and Grazing Activities

on the Rangeland/Jarosa Allotment Project
United States Forest Service

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In Conjunction with the

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JAROSA ALLOTMENT BEST MANAGEMENT PRACTICES

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Introduction

The Jarosa/Rio Puerco de Chama Riparian-Rangeland Management Project was established to reduce pollutants into the Rio Puerco de Chama, Jarosa Creek, and the Rito Redondo watersheds. This report shall explain the steps that were taken to protect and improve water quality in the Jarosa allotment. Since grazing is a primary source of activity in the allotment various structures or Best Management Practices (BMPs) were introduced to alleviate the grazing pressures in the allotment.

Location/Activity

The Jarosa Allotment Project is located in the Santa Fe National Forest Coyote Ranger District, Coyote, New Mexico. The Jarosa grazing allotment encompasses the headwaters of the Rio Puerco de Chama and the upper portions of Jarosa Creek and the Rito Rendondo watersheds. Thirteen permittees from six families graze 343 head of cattle on this allotment. This allotment has used season-long grazing system on one pasture. Cattle are placed on the allotment in the spring and collected in the fall with little or no active livestock movement. This practice has resulted in the concentration of livestock and subsequent over-utilization of the riparian areas of the Rio Puerco de Chama, Rito Rendondo, and the wet meadows associated with Jarosa Creek. These areas make up a small percentage of the allotment, but incur the majority use. The allotment contains many mesas, slopes and uplands that produce good forage, but lack of water prevents utilization of these areas. To allow riparian areas and wet meadows to recover, a rotational grazing system must be developed. This development includes dividing the allotment into five pastures for rotation, construction of riparian protection fences, and most importantly the development of water sources in the uplands (Information from Project Proposal, USDA Coyote Ranger District).

The drought of 1996 and 2002 has taken a heavy toll on the allotment. Although livestock numbers were reduced, the vegetation was severely stressed by the lack of precipitation. A rotational grazing system that allows grazed vegetation to rest is essential for recovery of the allotment. This type of system has been successfully used in other parts of the Coyote District with similar resource conflicts. This district implemented a rotational grazing system in the Rito Chihuahenos watershed. Riparian density and diversity increased as soon as cattle were exclosed from riparian areas. Upland forage quality and quantity improved when the rotation system was implemented.

The Santa Fe National Forest Coyote Ranger District (SFNFCRD) and the New Mexico Environment Departments Watershed Protection Section (WPS) have been working together in the improvements of water quality for the Rio Puerco de Chama, Jarosa Creek, and Rito Redondo watersheds of the Jarosa allotment. The Coyote Ranger District applied and received a 319 (h) grant from the WPS to improve water quality and the riparian areas in the Jarosa allotment. The water quality improvements include divisional fencing (for rotational grazing), cattle guards, earthen dams, and trick tanks.

Best Management Practices Implemented

Trick Tanks

Trick Tanks are structures that are naturally fed by rainwater or snow melt. Trick tanks should be located in grazing areas that have no access to water sources such as rivers, streams, or springs. Not only do trick tanks help in water containment and storage, but help alleviate grazing activities on riparian environments. By placing trick tanks in waterless grazing areas wildlife and livestock are diverted away from riparian areas thereby reducing degradation of riparian zones and improving water quality in watersheds by reducing impacts to streambank stabilization, turbidity, and bacteria. The benefits are: 1) Less pressure of grazing activities in riparian zones. 2) Diverting of wildlife and livestock to unused forage areas, due to lack of water sources. 3) Reduction of fire danger from piled dry grass. The possibilities for trick tanks are endless for grazing activities. The trick tanks can be located virtually anywhere in any range and grazing area. Trick Tanks can and may seem expensive, but in the long run the benefits out weigh the cost.

This manual is intended to show those interested in grazing the benefits that will be gained using the trick tank implementation on the range. The photo documentation will address the process, which was used to implement the structures on the Jarosa Allotment of the Coyote Ranger District Santa Fe National Forest.

Photo No. 1

The preliminary stage of trick tank implementation is to clear and level the ground in which the trick tank structure will be located. Preparation will take into consideration the size of the structure. In the Jarosa allotment, for example, a 10,000 gallon containment structures was implemented. A crew went in leveled and prepped the site prior to structure implementation.

Photo No. 2 **Photo No. 3**

After leveling and prepping the site a circular ring one foot wider in diameter then the trick tank structure was imbedded into the ground where the trick tank will be located. The imbedded ring is then filled with 3/4 inch size gravel. The imbedded ring should be 8 inches deep inside the ring; the crew then spreads gravel evenly inside the ring with a landscaping rake. The gravel is used as a venting system in an effort to eliminate moisture from settling underneath the trick tank structure. This reduces the rusting action associated with metal corrosion.

Photo No. 4

Photo No. 5

The trick tanks placed on the Jarosa were transported by a one ton rig and a goose neck trailer, as noted in photo no. 4 the structure is a half unit that will be welded together at the project site. Since the unit is 10,000 gallons it is virtually impossible to transport it as a single unit into the type of terrain that exists at the project site.

Compare the size of the unit in photo no. 5 to the front-end loader. The front-end loader will unload the half unit and will transport it to the project site.

Photo No 6

Photo No. 7

The front-end loader will transport and place the two half units on the gravel ring (photo no. 6). After the two halves are conjoined or welded together the front-end loader makes adjustments to make sure that the unit is stabilized. The welds will be checked for leaks and appropriate measures will be taken if the welds are breached. The welded areas are coated and painted to maximize life expectancy of the structure (photo 7).

Photo No 8

Trick tank should be located and placed at a higher elevation then the trough system. This will be discussed later in this report at the Powder River trough systems.

(See photo no. 18)

Photo No 9 **Photo No. 10**

4x4x8 treated wooden poles were placed vertically to hold the roof in place for the trick tank structures. 2x6x10 wooden planks were used for the roof. The roof was dropped a foot in the center of the structure so that rainwater and snowmelt enters the structure by gravity flow. 10x3 corrugated steel sheeting was placed over the 2x6x10 to deliver the water source into the trick tank.

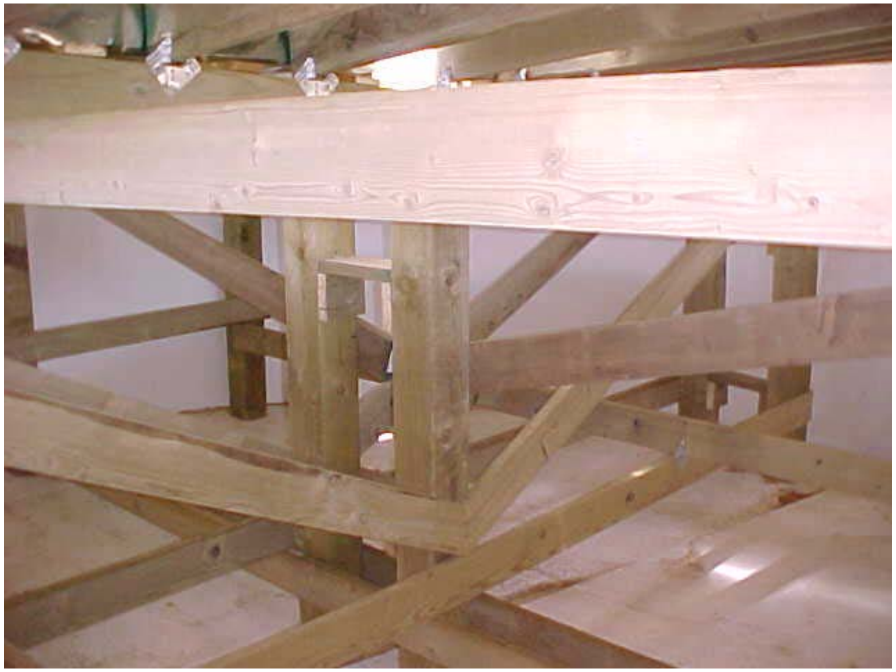

Photo No. 11

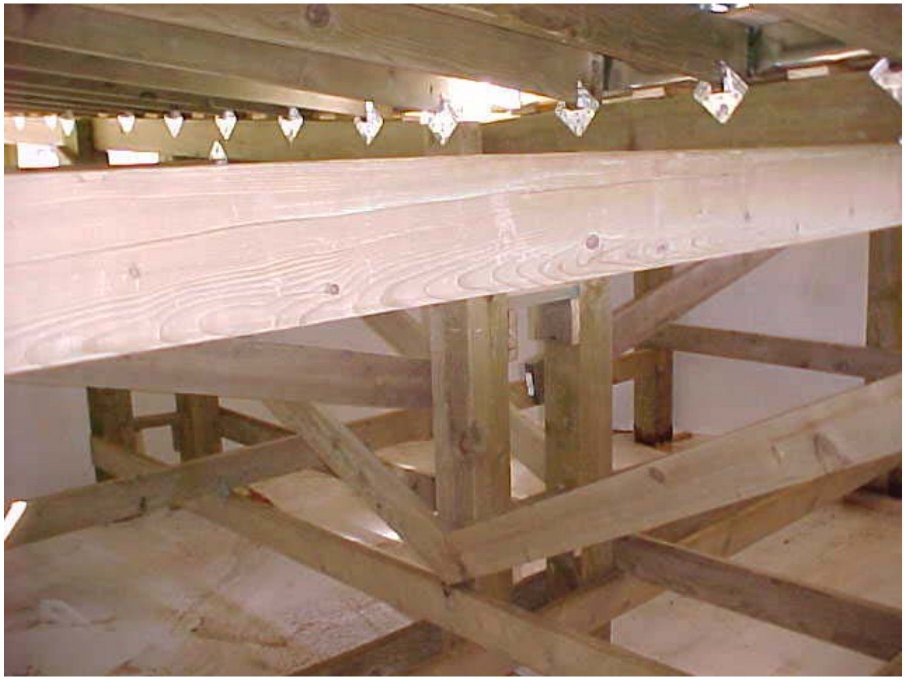

Photo No. 12

The 4x4x8 beams had to be cut in various custom sizes to drop the roof into the center of the structure. The beams and planks were tied to each other with nails and bolts inside the trick tank. No specifications were retrieved from USDA Forest Service regarding this structure. Since in reality trick tanks can be of differing sizes discretion is up to builder on type of anchoring for the roof. Note photos 11&12 and how the planks and beams have been tied in to ensure solid non-moveable structure.

Photo No. 13

The finished roof drops into the trick tank and a sheet metal channel has been added in the center to ensure that all water flowing from the roof enters the structure. It is important to remember that every last drop of runoff from the roof is important to harvest into the structure especially in these type of environments. The drought of 2002 showed us the real importance of water in these areas.

Photo No. 14

Photo No. 15

Photo 16

If you look at the photo you will see the drop of the roof into the center of the structure. Note: that half of the roof is finished while the other half shows the horizontal planks holding the soon to be roof. In the drop section or middle of the roof (photo 15) you can see the sheet metal channel structure diverting the flow into the trick tank.

Photo. No 17

The troughs that are used on the Jarosa allotment are Powder River type troughs. These are used because of their high quality durability in harsh environments.

Photo No. 18

The Powder River troughs are located at a lower elevation because water flow is by gravity (see photo 18). Note, the trick tank in the background is located at a higher elevation. The water from the trick tank is fed by gravity.

Photo No. 19

Photo No. 20

The trough systems is stabilized by staking T-posts around the trough and securing it with tie wire. Troughs are placed on 4x4x10 foot beams to protect them from rusting and from sinking into the ground. The trough system has a float unit that releases enough water to fill it and protects against overflow, <u>similar to a toilet bowl system.</u>

Photo No. 21

Photo No. 22

The trick tanks have been placed in areas that are isolated but not inconvenient to locate. These structures are well hidden and blend into the surrounding environment.

Earthen Dam Structures

These structures are usually constructed of soil by heavy equipment like bulldozers or front-end loaders. Earthen dams are usually constructed in ephemeral type watersheds. The purpose of the structure is to retain water in isolated and waterless areas. The amount of water in the dam depends on the size and the soil type. Sandy type soils do not retain large amounts of water for too long because of porosity, while clay type soils retain water a lot longer because of minimal porosity and less seepage. Evaporation of standing water is another loss that occurs with dam structures.

Photo No. 23

Photo No. 24

Photo No. 25

Photos 23, 24, and 25 are the typical type of the earthen dam structures that have been implemented on the Jarosa allotment. The soil type in this area contains a high amount of clay. Earthen dams will work better in wet seasons than in drought years. In some areas bentonite may be used to cap high seeping dams.

Cross Fencing (for rotational grazing practices)

Photo No. 26

The Jarosa allotment has been cross-fenced for the purpose of rotational grazing. The rotation of cattle in the sectioned allotment helps heal and alleviate pressure from grazing activities throughout the allotment. Cross sectioning of the allotment helps grasses and forage grow a lot better than as a single unit grazing system as it was before BMP implementation in the Jarosa allotment.

Cattleguards

Cattleguards are essential because they eliminate the need of gates. Cattleguards act as safety net in that cattle stay in designated sectioned areas, while traffic and individuals eliminate the need to open and close gates, especially in public lands.

Photo No. 27

Photo No. 28

Conclusion

The Best Management Practices (BMPs) that have been introduced along with the Range Management Plan for the Jarosa allotment of the Coyote Ranger District will help improve water quality, improve grasses and forage, and will include the allotment permittees in the decision making process along side the forest service. The implementation of the trick tanks, earthen dams, cross-fencing, and cattlegaurds will help the Jarosa allotment and its environment in improving the way grazing management activities will be conducted along riparian and watershed areas.

New Mexico has been in drought conditions since 1996, or possibly earlier. The Jarosa allotment project should represent a model for water quality improvements in our national forests. These improvements have already generated positive results. For example, trick tanks in a two-day drizzling rainfall period-generated 6, 000 gallons of water into a 10,000 gallon structure. Secondly, grazing activities are being conducted in an area that never was utilized before because of the lack of water (verbal communication SFNFCRD). With the introduction of water in non-grazed areas the grazed areas and their riparian environments are getting a deserved rest. The introduction of water in these non-grazed areas have led to the rangeland use of forage and grasses that had never before been grazed. It is these kinds of innovative ideas that help solve problems, and the Coyote Ranger District is taking such action.